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ABSTRACT

 This report discusses federally sponsored research at
educational institutions and suggests ways to improve accountability
for these funds. The following suggestions are made for minimizing
problems presented in this report: (1) development of more definitive
cost principles for both the institutions and the Federal auditors to
follow: (2) more active involvement of internal auditors at the
institutional level: (3) more oversight by grantor agencies with
respect to how research moneys are being spent: and (4) increased
Federal audit effort. (JD)

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REPORT BY THE U.S.

General Accounting Office

SP

Federally Sponsored Research At Educational Institutions-- A Need For Improved Accountability

Educational institutions receive about \$3.8 billion a year through Federal grants and contracts for the conduct of research. Under present systems and methods in use at educational institutions, the Federal Government cannot reasonably be assured that Federal funds are effectively being used for specific research objectives. Many of the problems discussed in this report are the result of the wide latitude and flexibility given to educational institutions by Federal Management Circular 73-8. Strengthening the cost principles is required since the absence of more definitive guidance has resulted in varying interpretations and practices and in much disagreement between the Federal Government and educational institutions.

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

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PSAD-78-135
AUGUST 18, 1978



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

PROCUREMENT AND SYSTEMS
ACQUISITION DIVISION

B-162223

The Honorable James T. McIntyre, Jr.
Director, Office of Management
and Budget

Dear Mr. McIntyre:

This report discusses federally sponsored research at educational institutions and suggests ways to improve accountability for these funds.

This review was made because of the significant amount of Federal research dollars awarded to educational institutions, congressional interest, and recent coverage in the news media of instances of lack of proper accountability for such funds.

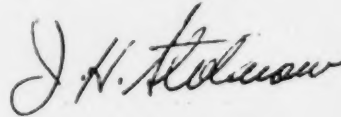
This report contains recommendations to you on page 26. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations to the Senate Committee on Governmental Affairs and the House Committee on Government Operations not later than 60 days after the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

We are sending copies of this report to the House and Senate Committees on the Budget; House Committees on Science and Technology and Government Operations; and the Department of Health, Education, and Welfare. Copies are also being sent to the Subcommittee on Reports, Accounting, and Management, Senate Permanent Subcommittee on Investigations; the Subcommittee on Federal Spending Practices and Open Government, Senate

B-162223

Committee on Governmental Affairs; the Subcommittee on Health and Environment, House Committee on Interstate and Foreign Commerce; Subcommittee on Intergovernmental Relations and Human Resources, House Committee on the Budget.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "J. H. Stolarow". The signature is written in a cursive, flowing style with some loops and flourishes.

J. H. Stolarow
Director

GENERAL ACCOUNTING OFFICE
REPORT TO THE DIRECTOR OF THE
OFFICE OF MANAGEMENT AND BUDGET

FEDERALLY SPONSORED RESEARCH
AT EDUCATIONAL INSTITUTIONS--
A NEED FOR IMPROVED
ACCOUNTABILITY

D I G E S T

Educational institutions receive about \$3.8 billion a year through Federal grants and contracts for the conduct of research. This review was made to determine the adequacy and reliability of the systems and methods educational institutions used to identify and account for research costs. We visited 6 major educational institutions, 4 State and 2 private, chosen from the top 100 institutions that receive about 80 percent of total Federal funds. Similar problems were found at each of the six institutions which use an accounting system of funding for Federal research money which GAO believes is basically similar to systems used at other institutions receiving research funds. To review the adequacy of these systems, we selected a total of 25 federally sponsored research grants.

Under the present systems and methods in use at educational institutions reviewed, it is difficult for the Federal Government to be reasonably assured that its funds are being used effectively for specific research objectives. The very nature of research, coupled with management deficiencies, and the lack of internal controls make it difficult to accurately determine costs applicable to research. Management deficiencies identified in this review include imprudent and/or questionable charges to Federal research grants. Many of these charges were not related to the specific grant charged.

Federal grantor agencies generally have not been diligent in the financial management oversight of the Federal research moneys which they administer. This fact, coupled with the lack of institutional internal management reviews, has contributed to the continued existence of

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management deficiencies. (See ch. 2.) The accounting practices the six educational institutions used did not provide a reliable basis to verify the validity of many direct costs charged to research, especially personnel costs which comprise about 60 percent of the cost of research. In addition, the six institutions were inconsistent in classifying direct costs and indirect costs. Some indirect costs were charged directly to research but not to other activities. Such inconsistencies increase both the direct and indirect costs recovered under Federal research projects. (See ch. 3.)

The Office of Management and Budget has recently developed revisions to Federal Management Circular 73-8, which provides the guidance to educational institutions for accounting for the use of research grant funds. Some of these revisions improve this circular by providing more definitive guidance. The significant improvements (1) restrict the latitude allowed institutions for allocating indirect costs to research activities in that the preferred base of allocation is clearly spelled out for each indirect cost pool and (2) require that research costs be charged to departmental administration on a consistent basis with similar charges to instruction and other institutional activities.

GAO believes that, although the Office of Management and Budget's revisions have improved the circular, major weaknesses remain. The foremost weakness is in the area of compensation for personnel costs which, as noted previously, accounts for about 60 percent of research costs at institutions.

It is GAO's opinion that the Office of Management and Budget's proposed changes for personnel costs do not require the degree of accountability necessary to assure that funds are spent for their intended purpose. The Department of Health, Education, and Welfare (HEW) had previously made some suggestions to the Office of Management and Budget for strengthening the requirements for accountability over personnel costs and other cost categories. In addition, HEW is planning its response to the Office of

Management and Budget's proposed changes.

CONCLUSIONS

The problems presented in this report can be minimized through

- development of more definitive cost principles for both the institutions and the Federal auditors to follow,
- more active involvement of internal auditors at the institutional level,
- more oversight by grantor agencies with respect to how research moneys are being spent, and
- increased Federal audit effort.

Absence of more definitive guidance has resulted in varying interpretations and practices and in much disagreement between the Federal Government and educational institutions. GAO therefore believes that developing more definitive cost principles would serve as the cornerstone for effective performance of audit and oversight efforts.

Some of the Office of Management and Budget's proposed revisions to the circular, along with HEW's suggestions, offer a potential to solve many of the problems identified in this report. Such revisions would further minimize the ambiguities and the discretion institutions have in this area and place more responsibility on the institution for self-policing its activities.

RECOMMENDATION

GAO recommends that the Director, Office of Management and Budget, reconsider the suggested HEW revisions, especially in the area of compensation for personal services. Such revisions would, in our opinion, provide a more objective and reliable basis for the determining and reporting effort devoted to federally sponsored research.

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ABBREVIATIONS

FMC	Federal Management Circular
GAO	General Accounting Office
HEW	Department of Health, Education, and Welfare
NIH	National Institutes of Health
NSF	National Science Foundation
OMB	Office of Management and Budget
PI	principal investigator

CHAPTER 1

INTRODUCTION

The Congress has recognized a continuing national need for the conduct of research. This need, in large part, is fulfilled by educational institutions through receipt of Federal grant moneys.

MAGNITUDE OF FEDERALLY SPONSORED RESEARCH

In fiscal year 1977 tens of thousands of individual grants and contracts were awarded in excess of \$3.8 billion to educational institutions for the conduct of research. Over 70 Federal agencies sponsor or otherwise support basic research involving over 2,000 educational institutions. The major sponsoring agencies are the Department of Health, Education, and Welfare (HEW); the Energy Research and Development Administration; and the National Science Foundation (NSF). This Federal commitment has increased dramatically over the past 20 years. (See graph on the next page.)

The research being sponsored by Federal agencies is generally basic or applied. Basic research is for the development of increased knowledge in a particular scientific area, whereas applied research is more of a practical application of the knowledge developed from basic research. The mechanism used to award most research moneys is a grant. These grants are primarily unsolicited by Federal agencies and are evaluated for scientific merit by peer review groups.

COMPONENTS OF RESEARCH COSTS

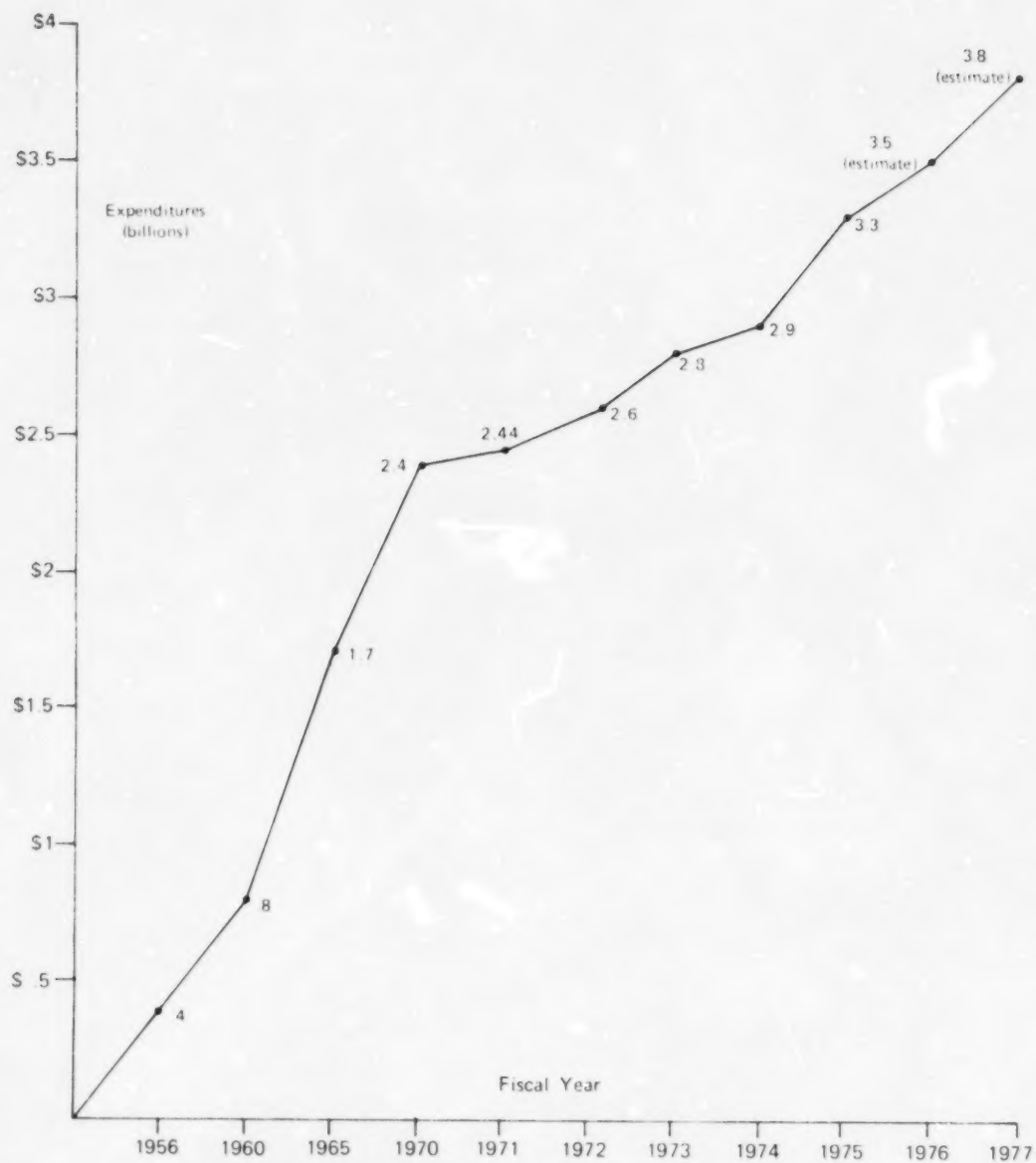
The allowable costs of a research agreement consist of the direct costs incident to performance plus an allowable portion of indirect costs. No provision for profit or increment over cost is intended.

Direct costs

Federal guidelines state that direct costs are those which can be specifically identified with a particular project or which can be assigned to a project with relative ease and a high degree of accuracy. The guidelines require these costs to have an identifiable benefit to the research project charged. It is not sufficient that the costs be of the nature generally associated with research. Identifying and assigning direct costs to a given project is generally

FEDERAL EXPENDITURES FOR RESEARCH
AT EDUCATIONAL INSTITUTIONS
(note 1)

FISCAL YEARS 1956 1976



1/ Includes federally funded research and development centers administered by educational institutions

delegated to the individual in charge (i.e., principal investigator) of the project. Typical costs chargeable directly to a research agreement include salary and wages of research personnel, equipment, and supplies and services.

Indirect costs

Federal guidelines state that indirect costs are those incurred for common or joint objectives and cannot readily be identified to a specific activity. The guidelines require these costs to be allocated or apportioned to the institution's primary activities in reasonable proportions according to their contribution to each activity. "Primary activities" are defined as instruction, organized research, and other institutional activities. The indirect cost dollars allocated to organized research are converted to an indirect cost rate which is computed by dividing the allocated indirect costs by a base generally consisting of either the total direct costs or the direct salaries and wages associated with research. This rate is applied to the costs of individual research projects to compute the applicable indirect costs. Appendix I shows the steps in identifying research costs. A simplified example of how indirect costs are allocated is illustrated in appendix II.

Institutions, under Federal guidelines, can select the method and base to be used to allocate the indirect costs to the activities benefited. HEW is the primary agency responsible for approving the indirect cost rate at educational institutions.

ACCOUNTABILITY OF RESEARCH FUNDS

Federal guidance to educational institutions for determining costs applicable to grants and contracts with educational institutions was issued under Circular A-21 in September 1958. Federal Management Circular (FMC) 73-8 issued December 19, 1973, superseded Circular A-21. The policy formulation and the general oversight of these cost principles are the responsibility of the Office of Management and Budget (OMB). In addition, OMB recently revised FMC 73-8. The proposed revisions are currently out for comment (OMB refers to its revisions of FMC 73-8 as A-21).

The Federal Government generally has relied on the integrity of the institutions and their accounting systems to provide assurance that research funds are used for intended purposes. The Federal guidelines provide principles designed to recognize all costs of such research under generally accepted accounting principles. The guidelines also provide

that the scope, interpretation, and application of such principles require a mutual understanding between institutions and the Federal Government and that institutions not be required to significantly change their accounting practices.

With respect to Federal research funds, educational institutions are required to employ sound management practices. Federal regulations require separate budgeting and accounting of Federal research funds. Expenditures of Federal funds are limited to those costs which are (1) deemed reasonable and necessary by a responsible and prudent individual, (2) allocable to the funded effort through the consistent application of the prescribed principles, and (3) not expressly disallowed by Federal guidelines. Institutions are required to submit interim and final reports detailing the scientific results and total costs incurred on the funded projects.

We made this review to evaluate the reliability and integrity of the methods and systems educational institutions used for classifying and allocating costs to Federal research grants.

SCOPE OF REVIEW

We visited 6 major educational institutions, 4 State and 2 private, chosen from the top 100 institutions that receive about 80 percent of total Federal funds. The institutions were selected on the basis that they would be representative of most universities and would not have unique accounting systems. Some were selected at the suggestion of the National Association of College and University Business officers.

Indications of deficiencies identified during our review were discussed with responsible Federal agency officials for appropriate followup action. To review the adequacy of these systems, we selected a total of 25 federally sponsored research grants. For each grant reviewed, we evaluated the propriety and reasonableness of selected direct charges to the grant. At each institution, we reviewed the methods and bases used for identifying and allocating indirect costs to research.

In addition, we held discussions with officials and principal investigators (PIs) of each institution we visited, Federal auditors as well as with representatives of NSF, and HEW grant and audit officials, OMB, and the Cost Accounting Standards Board.

We made our review during the period January 1977 to August 1977.

CHAPTER 2

MANAGEMENT WEAKNESSES RELATING TO RESEARCH PROGRAMS

At the educational institutions we visited, we found instances of financial management weaknesses in the administration of Federal research projects being conducted on college and university campuses. We believe the primary causes were the existence of very flexible guidelines for charging costs to Federal research grants and delegating the responsibility for financial management to research staff without adequate guidance or independent review. We noted little being done by the Federal grantor agencies or by the educational institutions to assess the effectiveness of financial management practices.

LACK OF GUIDANCE AND GOOD MANAGEMENT PRACTICES

The large educational institutions we visited administered more than 1,000 active individual grants and contracts each year. Whereas each institution is responsible for administering the grants and contracts it receives, the PI is directly responsible for managing and conducting the research. The PI of each project makes the final decisions on expenditures of grant funds subject only to general compliance guidelines and budget constraints. Although PIs generally have strong research capabilities, they are not necessarily trained in management skills. The PIs we questioned said they received little or no guidance from the institutions on how to properly manage their funds. The guidance materials the institutions provided to them generally related to such matters as instructions on preparing research proposals and reporting requirements.

Most grants and contracts provide that institutions recover their indirect costs through predetermined indirect cost rates. Using this approach can be a disincentive for controlling costs since it encourages institutions to increase direct costs of research to maximize indirect cost recoveries.

Also there is little incentive for reducing costs when occasions to do so arise since unused grant or contract funds remaining at the conclusion of the award period are to be relinquished to the grantor agency.

AGENCY EVALUATION OF GRANTS AND CONTRACTS

Although research programs warrant an extensive audit or management evaluation, the six institutions generally did not allocate staff for this purpose. Also audits and other evaluations conducted by HEW and other grantor agency audit groups have been minimal. Research proposals and budget requests generally were evaluated before the award of grants and contracts. Evaluations of the management performance during the progress or after completion of the project were not routinely performed.

The procedures for monitoring research projects varied from agency to agency. One method of monitoring is to conduct site visits and review periodic financial and progress reports institutions submitted. For example, an official of the National Institute of Neurological and Communicative Disorders and Stroke stated that a site visit typically involved reviewing facilities to evaluate the capability of equipment, laboratory instruments, and so forth in performing the proposed research.

Approaches taken by Federal auditors vary. Auditors often review individual, direct cost categories on a selective basis. Their audits are performed in cycles; each segment is reviewed at selected intervals. In other cases, contracts and grants are audited on a request basis by various sources, including grantor agencies and PIs. The number of requests cover only a small percent of the total projects. Indirect costs at institutions are usually audited at 3-year intervals or longer.

MANAGEMENT DEFICIENCIES

A potential for management deficiencies exists in view of the broad scope of many research programs, a dispersement of management responsibilities, and a lack of independent review or audit.

In investigations made as a result of allegations made by PIs and others at 14 educational institutions, National Institutes of Health (NIH) auditors found over \$632,000 in salaries and wages charged to research (1) for which no services had been provided, (2) were unsupported, or (3) were otherwise deemed improper. They also found over \$48,000 in travel, equipment, and other expenses charged to research which were unrelated to research. Findings of other Federal auditors at eight major educational institutions around the country showed similar misuse of Federal research funds.

Our review of direct costs charged to research revealed similar findings. We found expenditures that were either improper and expressly disallowed by FMC 73-8 or were unrelated to the research project charged. Other examples, however, were in the gray area. Although related to the funded effort, these examples, in our opinion, were imprudent from a financial management standpoint. However, resolving the propriety or impropriety of these expenditures is very difficult. Although only 25 research projects were reviewed, the frequency of examples noted indicate that their existence may be widespread.

Regarding unallowable or unrelated expenditures for research projects, we found the following examples of expenditures for

- repair and fabrication of equipment unrelated to the research projects;
- personal long-distance telephone calls;
- entertainment, including admissions, refreshments, and transportation; and
- salary of a researcher who did not work on the grant during the period charged.

Some examples of what we consider to be "gray area" expenditures follow.

- One PI purchased, without prior approval from the the sponsoring Federal agency, a computer terminal and charged \$23,343 to his research grant. A researcher on the project stated that a terminal with similar capabilities was available at a nearby campus building and had been used prior to the purchase. He said the new terminal was purchased because of the inconvenience of walking to the nearby building and a 10-to-20 minute waiting period to use the older terminal.
- \$5,360 was expended from a grant for advance payment of a 16-month lease on a tractor. The lease included a purchase option which was expected to cost \$560. Outright purchasing instead of leasing was not considered and no consideration was received for advance payment.
- A PI authorized an advance payment of \$3,400 for 136 hours' use of a computer. The PI did not

maintain records or otherwise seek to determine the actual usage of the computer.

Departmental use of research funds

Other institutional officials also made questionable use of research funds. Although a PI is normally responsible for use of research funds, we found department officials used these funds without approval or, in some cases, knowledge of the PI. In some cases, funds used by others were unrelated to the research project.

- Building improvements costing \$2,980 were charged to three research grants without PI approval and, in one case, without the knowledge of the investigator. Because the improvements were a capital expenditure consisting of new plumbing outlets, we believe they should have been added to building costs and paid for with institution funds.
- In some cases, it was the practice of department officials to charge research grants for services such as secretaries, telephones, and copying machines even though the services involved were used by individuals who performed both research and nonresearch tasks. Grants were directly charged \$3,028 for telephone services and \$998 for copying machine services without PI approval and were partly performed for nonresearch purposes.
- In two cases, department officials improperly assessed research grants with the cost of films and publications used exclusively for instructional purposes and for refreshments served during department functions without approval of the PI's involved.
- Department officials borrowed \$7,274 from two research grants for department use. The funds were used to pay for rental of department copy machines and general office supplies unrelated to research purposes. The department head disclosed that such loans had also been previously made and that repayment was provided for with the promise that the department would provide free support to the research effort.
- \$234 of grant funds were used to pay for travel of the grant's PI even though the travel was not for research purposes.

In other cases, PIs stated that department officials required that costs incurred by PIs which were remotely related or in some instances even unrelated to their research be paid from the research grants. Remodeling costs and office equipment, travel, and publication costs incurred by PIs but primarily for departmental or other benefits were examples cited. In a few cases, PIs requested audits of these grants to bring appropriate attention to such improper use of grant funds. Federal audits made pursuant to such requests have disclosed significant improper use of funds.

Transfer of research costs

Although FMC 73-8 requires institutions to return unused funds on research projects, they have, at times, avoided doing so by transferring costs between research projects to eliminate or minimize deficiencies and surpluses. FMC 73-8 prohibits such improper transfers.

In one case, \$6,834 was transferred to a grant to avoid returning unused funds. Some of the costs transferred were incurred 14 months before the transfer. In two other cases, substantial overexpenditures were recovered by transferring costs of \$17,480 and \$27,609 to other research grants. Transfers of smaller amounts were common among other grants.

Discussions with seven PIs indicated that they were not aware that such practices are improper. Five stated they routinely used transfers to balance their funds at yearend. Five said they did so on the instructions of their departments or administrative officials or the institutions made fund transfers without the PIs' approval or knowledge.

CONCLUSIONS

Neither Federal agencies nor the educational institutions reviewed had a well-organized system for managing and accounting for grants and contracts. Evaluations by sponsoring agencies generally are of a technical nature and are limited to research proposals and budget requests prior to the award of grants and contracts. Audits and evaluations of the financial management performance during the progress or after completion of a project are not routinely performed. Although large research programs warrant internal audits, the institutions typically do not allocate staff for this purpose. Audits conducted by grantor agencies have also been minimal.

CHAPTER 3

IMPROVEMENTS NEEDED IN ACCOUNTING FOR PERSONNEL COSTS

This chapter discusses the problems inherent in accurately determining the reasonableness of direct charges to research activities for personnel costs. Personnel costs represent about 60 percent of the direct expenditures for research.

Accurately identifying research-related direct costs is particularly difficult in that research is often inseparably blended with instruction. The purpose of Federal research is to benefit the Nation by supporting research compatible with an institution's instructional function. As such, the conduct of research bears a very close relationship to that of graduate schools. Because of this close relationship, research is generally performed in conjunction with or in close proximity to instruction. Many of the personnel, facilities, supplies, and services used in research are also used in instruction. For example, faculty members are often simultaneously involved in instruction and several research projects. Although detailed time and usage records would be of value for accurate accounting, generally they are not required or maintained.

PROBLEMS WITH CURRENT SYSTEM OF ACCOUNTING FOR PERSONNEL COSTS

Since 1958 most educational institutions have used a system called effort reporting to support professional salary charges to research. The system is a compromise from the daily time records normally considered essential support for commercial organizations. Educational institutions have strongly resisted requirements that faculty maintain any record of time. This compromise system, however, does not offer reasonable accountability for salary charges. The validity and propriety of these charges, therefore, are not subject to effective audit.

Under the effort reporting system, researchers or persons having firsthand knowledge of the researchers' activities provide monthly after-the-fact reports on actual effort expended. The preparer is required to identify instances in which the actual effort differs from that which was budgeted for. At institutions we visited, the accuracy of these reports was questionable because:

- No daily time records existed to provide reference.
- Research was often performed simultaneously with other activities, including instruction.
- The preparation at three institutions was done by department deans or administrators. These officials could not be expected to have good firsthand knowledge of all department researchers' activities over a month period.

According to Federal auditors, the reporting system was largely perfunctory in that deviations between budgeted and actual effort were not reported. The auditors also reported instances in which four institutions failed to render effort reports for extensive periods.

Officials at one institution acknowledged that they could not attest to the accuracy of many of the monthly effort reports. They pointed out that, from month to month, efforts of researchers occasionally may deviate from that indicated on effort reports but that such deviations tend to average out over an extended period. The officials explained that, although they complied with requirements for preparing effort reports, they felt that the system was not effective or worthwhile.

Although effort reporting has been in effect since 1958, there has been much dissatisfaction with it. In 1968 a Federal interagency task force reviewed effort reporting and concluded that there was no way beyond simply accepting the research results to prove the actual time spent on a particular research project. They also found that some faculty members felt it was fallacious, meaningless, and incompatible with the creative process and that it generated considerable internal paperwork and inefficient recordkeeping. The task force concluded that effort reporting

- was meaningless and a waste of time;
- engendered an emotional reaction in the academic community that would endanger university-Federal relations; and
- fostered a cynical attitude toward Federal requirements and took valuable effort away from important activities, including research.

ALTERNATIVE TO EFFORT REPORTING SYSTEM

One of OMB's proposed revisions to FMC 73-8 was to give educational institutions a choice between a system of monitored workloads or a system of personnel activity reports.

Under the system of monitored workloads, professional salary support is based on a preaward agreement which takes into consideration the researcher's total workload. This would include research projects, teaching loads, committee assignments, and so forth. The amount remains fixed and is adjusted for changes in the PIs' workload on the periodic report of expenditures submitted by the institutions.

The system of personnel activity reporting would show an after-the-fact reporting of the percentage of activity of each employee. Each personnel activity report would account for 100 percent of an employee's total compensated work in fulfilling his obligations to the institution. If significant differences between budgeted estimates and actual costs are indicated by the activity reports, prompt adjustments would be required.

We believe that using these systems, with the adoption of previous recommendations made by HEW (see ch. 5), would minimize the problems in the area of compensation for personal services.

CHAPTER 4

IMPROVEMENTS NEEDED IN ACCOUNTING

FOR OTHER DIRECT COSTS AND INDIRECT COSTS

The methods used and prescribed by Federal guidelines for educational institutions do not provide a reliable basis for verifying the validity of many direct and indirect costs charged to research. It is difficult to distinguish (1) research-related costs from those relating to instruction and other institutional activities and (2) direct costs from indirect costs.

In addition, the methods institutions use in determining indirect costs identifiable to research activities are arbitrary and complex. As a result, computed rates are difficult to evaluate and can be unreliable. Federal guidelines allow wide flexibility for institutions to select cost groupings, distribution methods, and allocation formulas for determining indirect costs. Since much judgment enters into determining indirect costs, it is difficult to evaluate the costs for propriety. Also the indirect cost computation often involves using voluminous survey data that cannot be reasonably verified or evaluated.

ACCOUNTING FOR OTHER DIRECT COSTS

FMC 73-8 defines "direct costs" as those that can be identified specifically with a particular research project, an instructional activity, or any other institutional activity or those that can be directly assigned to such activity relatively easily with a high degree of accuracy. In addition, FMC 73-8 requires that an institution be consistent in classifying similar costs; that is, that costs classified as direct to research are likewise classified as direct when incurred for instruction and other nonresearch activities. Indirect costs are described as those that have been incurred for common or joint objectives and, therefore, cannot be identified specifically with a particular research project, an instructional activity, or any other institutional activity.

By these definitions, many types of costs can be classified as either direct or indirect, depending mainly on the degree of diligence exercised in identifying the beneficiary for which the cost was incurred. For example, telephone expenses could be readily classed entirely as indirect costs. Some institutions, however, identify some

of the telephone usage with specific research projects. When a telephone is installed primarily for the use of a specific research project, all costs related to the telephone, including toll charges, are assigned directly to the research project. Accurate accounting for such costs is often complex in that some telephones have common usage by several research projects for both instructional and research purposes.

Charging such costs directly to research projects may be viewed as equitable only if institutions exercise consistency with respect to costs incurred by research, instructional, or other institutional activities. Whether an institution is consistent in classifying costs is a matter that must be evaluated during audits of research project costs. Auditors, therefore, are faced with the task of auditing other costs incurred by the institution, in addition to those charged to research projects.

The methods used by the six institutions to account for nonresearch costs were inconsistent with those used to account for research costs. Although the six institutions provided separate accounting for direct research costs, no separate accounting for direct cost was provided for in instruction and other activities. Instead, these nonresearch direct and indirect costs were commingled in department accounts without identification. For example, costs incurred directly for research by each unit within one institution's physics department were accounted for separately by each project. Other costs, including costs incurred directly for instruction and costs for the department's administration, were commingled without identification. Since direct costs were not classified for instructional activities, it was difficult to determine if the institution was consistent in classifying direct costs for research activities.

Under costing systems used by institutions, inconsistencies in classifying direct costs can have a pyramiding effect on reimbursements because indirect costs are recovered on the basis of direct costs. For an institution having an approved overhead rate of 60 percent of total direct costs, an excessive charge of \$1.60 occurs for each dollar of improperly classified direct costs.

In the case of general supply expenses, the six institutions were usually diligent in identifying as many costs as they could for direct assignment to research projects. For example, while it is common in cost accounting systems, for purposes of convenience, to classify office supplies to indirect categories, costs of office supplies used for research at the institutions were commonly classified as direct

costs. Following are examples of office supplies that were classified as direct costs.

Pens, pencils, pencil leads, paper, paper clips, rulers, erasers, scotch tape, staples, staplers, staple removers, rubber bands, glue, file folders, index tabs, address labels, calendars, notebooks, appointment books, date books, planner books, note pads, desk pads, typewriter ribbons, correction tape, scissors, tape dispensers, pencil sharpeners, letter openers, paper punches, dictionaries, thesauruses, picture hangers, bookends, and batteries.

Conceivably, such costs could be proper direct charges to research if a direct benefit resulted and institutions charged similar costs directly to other nonresearch activities. However, our review of supporting documents and interviews with PIs failed to establish such a benefit. Similar costs for indirect expenses were charged to departmental overhead accounts and thus a portion of these charges were allocated to research grants.

Direct charges for such items sometimes comprise a relatively large part of the grant. For example, direct costs charged to an NSF research grant during the 19-month period ended 1976 totaled \$70,277, compared to total costs of \$103,307 detailed below.

Salaries and wages:

Research personnel and faculty	\$40,827	
Secretarial and clerical	3,079	
Administration charges	696	
Technicians	343	
Leave and staff benefits	<u>8,537</u>	\$ 53,482

Expendable materials:

Office supplies	134	
Lab supplies	8,899	
Library materials	228	
Equipment rental	124	
Postage and freight	69	
Maintenance and repair of equipment	3,094	
Report costs	184	
Interdepartmental and technical services	3,373	
Telephone and telegraph	<u>690</u>	<u>16,795</u>

Direct costs	70,277
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Indirect costs	<u>33,030</u>
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Total	<u>\$103,307</u>
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Of the direct costs included above, some were common to types of costs included in the institution's indirect cost pools. The following analysis shows the amounts of direct and indirect for common types of costs that were assigned by the institution to the grant.

Description of cost		Cost assigned	
<u>Indirect</u>	<u>Direct</u>	<u>Indirect</u>	<u>Direct</u>
Use of buildings and equipment	Rental of equipment	\$ 2,930	\$ 124
Operations and maintenance of buildings and equipment	Maintenance and repair of equipment	5,003	3,094
General administration	None	5,687	0
Departmental administration	Secretarial and clerical	15,423	4,853
	Other administration		
	Office supplies		
	Postage and freight		
	Telephone and telegraph		
Library	Library materials	2,985	228
Student services	None	<u>1,002</u>	<u>0</u>
Total		<u>\$33,030</u>	<u>\$8,299</u>

Another institution recovered replacement costs for the same equipment using both direct and indirect charges. An NSF grant was charged direct for \$3,400 for computer services, including an estimated \$2,040 for recovery of equipment costs. This same equipment was also included in an equipment use allowance resulting in an additional recovery of \$449 in indirect costs over the term of the grant.

The appropriateness and reasonableness of many direct charges to research cannot be determined from existing records. As a result, management within the institutions and grantor agencies must rely on the verbal assurance of the researcher as to the appropriateness of many charges. This, coupled with the sheer number of research projects and transactions, precludes effective evaluation.

EVALUATION OF INDIRECT COSTS IS DIFFICULT AND UNRELIABLE

Determining indirect costs, even in the most sophisticated cost accounting systems, requires some degree of judgment in selecting allocation methods and the use of extensive estimates and analytical techniques. The results can never

be regarded as highly accurate. For purposes of instruction, institutions have never needed or developed such detailed cost data as is required to account for the use of Federal research funds. The six institutions had not devised the type of cost accounting system that is needed and used in commercial operations to develop accurate and reliable indirect cost data. Lacking such a system, indirect costs were determined from analysis of institution general financial reports and accounts supplemented by use of survey data.

Accurately determining indirect costs is further complicated in that many of the functions of research are similar to those of instruction and each function frequently draws on common campus resources. Allocating the costs of these resources must necessarily entail use of judgments and to some extent arbitrary methods. The six institutions made extensive surveys to refine the accuracy of cost allocations. These judgments and surveys are critical to the accuracy of indirect cost determinations.

Given wide discretion by Federal guidelines, we found inconsistencies among the six institutions in their manner of determining indirect costs.

Varying bases used to express overhead rates

During fiscal year 1975 a total of 92 different bases were used for overhead rates by institutions performing research for Federal agencies. In the negotiation of overhead rates between the Government and the institutions, the rate agreed upon is expressed as a percentage relationship of the indirect cost to some portion of the direct cost. The most common items we found included in the direct cost base were direct salaries and wages. Some institutions also included the cost of any one or more of related salary and wage costs, such as overtime, holiday, vacation, sick leave, consultant fees, payroll taxes, retirement, or miscellaneous employee fringe benefits. Other institutions included total direct costs.

FMC 73-8 provides that the overhead rate be based on total salaries and wages but that other bases may be used, provided it can be shown that they produce more equitable results. Since the factors involved are primarily judgmental, it cannot be established with any certainty whether this provision actually results in more equity. The guidelines, therefore, provide much latitude to institutions in selecting a distribution base.

Subjectiveness of indirect cost pools

According to FMC 73-8, the cost pools appropriate for determining overhead rates at an institution are a matter of

judgment to be determined on a case-by-case basis. The guide provides certain standard pools, most of which were used by the institutions included in our review. Following are the pools used and the rates determined for campus research at the six institutions.

Overhead rates for six institutions						
	1	2	3	4	5	6
	1975	1975	1975	1974	1975	1974
----- (fiscal year) -----						
Indirect cost pool categories:						
Building use allowance	\$2.35	\$3.56	\$6.34	\$3.45	\$2.98	\$2.21
Equipment use allowance	1.35	.88	2.80	3.50	5.29	5.58
Operation and maintenance	6.59	13.64	20.65	13.04	35.65	12.81
General and administration	9.02	6.30	10.37	3.97	6.76	11.40
Department administration	22.15	18.50	16.35	15.20	16.29	23.38
Student services	1.81	1.34	.94	.15	.51	-
Library	6.85	6.46	2.01	1.78	1.28	3.71
Research administration (note a)		1.13	1.88	13.29	1.71	5.05
Other				8.87	7.24	

a/Included as either direct costs or as a part of general and administration.

Our comments relative to the more significant indirect cost pool categories follow.

Department administration

Department administration represents administrative expenses incurred by departments at the various institutions, such as psychology, physics, and chemistry. Although the institutions separately accounted for department costs incurred for research purposes, none of the six institutions separately accounted for such costs for other activities. Departmental costs, other than those charged direct to research, were commingled without identification. The departmental administrative costs, therefore, had to be estimated to determine the costs to be charged to research projects.

Various methods were used to estimate the indirect expenses, but most involved the use of a questionnaire survey

conducted annually in which department staff were asked to estimate the percent of time devoted during the past year to administrative duties. The results of the survey were used as the basis for estimating salaries and wages and other department expenses applicable to administration.

A separate survey must be made for each department involved in research activities. At major institutions, many departments are usually involved. For example, one of the institutions we visited had 99 departments and another institution had 61 departments involved in research--each requiring surveys to estimate the cost of administration.

The departmental staffs generally do not maintain records of time or effort spent on administrative duties, and the accuracy of such estimates for an entire year based on memory is highly questionable. The accuracy of the estimates is particularly important, considering the large amount of costs allocated on the basis of the estimates.

Building and equipment use allowance

FMC 73-8 provides for use allowances on buildings and equipment instead of depreciation expenses. Use allowances are estimated by applying a rate of 2 percent a year for the cost of buildings and 6-2/3 percent for the cost of equipment. These rates imply a useful life of 50 years for buildings and 15 years for equipment. FMC 73-8, however, does not preclude reimbursements for buildings and equipment whose uses exceeded these terms.

Some of the building and equipment usage costs were inaccurate. For example, five institutions did not take complete physical inventories of equipment each year. One institution, for example, used an inventory system whereby each unit of equipment was inventoried only once in 8 years. Equipment which was retired from active use, therefore, was not disclosed on a timely basis, and annual use allowances could include items of equipment which were not used during the year.

--Institution records of buildings and equipment costs in one case were based on estimated replacement costs which, particularly for older buildings, may substantially exceed original cost.

The total use charges for buildings and equipment were allocated to research on the basis of building space used during the year. The space used was determined by annual

room-by-room surveys and prorated between research and other activities. This was fine for building usage but the method is questionable for equipment use charges because obviously there can be a poor relationship between building space and equipment usage. Furthermore, the estimate of space used was judgmental and virtually impossible to evaluate on an after-the-fact basis.

Operation and maintenance

These indirect expenses were also allocated mainly on the basis of building space used during the year. One institution, however, adjusted the basis whereby space was considered in use 52 weeks for research and only 44 weeks for instruction. The adjustment during fiscal year 1975 had the effect of shifting an additional \$105,000 of indirect expenses to research activities. Institution officials believed the adjustment was warranted because instruction was curtailed during 8 weeks each year. The adjustment seems unwarranted, however, because

- it is inequitable for research to pay to operate and maintain the space during unused periods when the space does not benefit research and
- the overhead expenses required to maintain the space are not reduced significantly during the periods the space is not used.

Library

Library expenses include books and library materials, salaries and wages, and building and equipment costs for operating the library. According to FMC 73-8, allocating library expenses should be made according to the population of students and other users. When this method yields inequitable results, other methods may be used. Following are the methods used by institutions contacted in this review.

- One institution identified library users by a survey conducted in 1970 whereby individuals entering the library during the test period were questioned as to whether they were students, faculty, or others. The results were used in prorating the library costs to the user groups. The library costs prorated to student users were allocated to instruction on the basis of classroom hours and to research on the basis of hours of work. This method resulted in

increasing the amount allocated to research since full-time researchers would average 40 hours of work each week, whereas full-time students would average only 16 hours of classes a week. The method and survey results were used to allocate library costs to research during 1970 and the succeeding 6 fiscal years.

--One institution arbitrarily assumed that researchers used the library twice as much as did students. As a result, the dollars allocated to research were doubled.

PRESSURE TO INCREASE INDIRECT COST RECOVERIES

Some officials of the institutions reviewed contended that the Federal Government was not paying its fair share of research costs. As a result, these officials feel that educational institutions are being forced to subsidize the Federal research program. Officials at one institution told us that State legislatures have, in some instances, asked them to minimize this subsidy or face a reduction in State appropriations. For these reasons, as well as increased inflationary pressures in all phases of their operations, officials at two institutions told us they were compelled to seek an increase in the recovery of indirect costs.

Institutions, through assistance of consulting firms, have devised methods for developing or increasing indirect cost rates. In one case, a consulting firm devised a computerized system for rapidly testing numerous formulas or bases for allocating indirect costs and thereby identify those which result in the largest recovery.

Other consulting firms have developed computerized systems that help institutions to substantially increase the recovery of indirect costs associated with the use of buildings and equipment for research. Under these systems, building costs are reclassified into two categories, one covering the building cost and the other the cost of permanently installed equipment, such as elevators, air conditioning, plumbing fixtures, and miscellaneous items, such as shelving and light fixtures. Once reclassified, institutions are permitted under Federal guidelines to recover use charges for the equipment category at the rate of 6-2/3 percent a year rather than 2 percent a year under the building category. Some of the consultants' fees were charged to research administration accounts and were partially recovered from research funds.

CONCLUSIONS

Indirect cost rates at educational institutions are based on arbitrary methods and judgmental factors which make the evaluation of the propriety of such rates very difficult. As a result, it is difficult for the Federal Government to assure itself that charges for such cost are reasonable.

There is probably no feasible way for determining indirect costs that is both simple and reasonably accurate. At educational institutions, this task is extremely difficult. Institutions are adamantly opposed to the amount of recordkeeping that is already required, and it is probably unrealistic to expect such institutions to develop a new and a more sophisticated system. The institutions also claim that they need flexibility to allow for diverse conditions and that a rigid uniform method would result in inequities.

CHAPTER 5

PROPOSED CHANGES TO INSTITUTIONS' ACCOUNTABILITY FOR RESEARCH FUNDS

Various improvements to FMC 73-8 have been made or suggested in recent years. In the belief that too much flexibility was provided to educational institutions for assigning costs to research, HEW has made several recommendations for strengthening FMC 73-8 and is planning its response to OMB's proposed changes. The majority of the HEW recommendations were considered unacceptable by the educational community. OMB has recently developed a new series of suggested revisions (renamed Circular A-21). These revisions have been published in the Federal Register for comment.

In our opinion, while the suggested revisions by OMB would improve FMC 73-8, there is still too much flexibility for educational institutions to assign costs to research.

IMPROVEMENTS MADE

One of the major problems highlighted in this report is the arbitrary manner in which institutions allocated indirect costs to research activities. (See ch. 4.) This has resulted mainly because of the wide latitude given to the institutions in selecting bases to be used for allocating the indirect costs. The current revisions to the circular restrict such latitude in that a basis of allocation is clearly spelled out for each indirect cost pool. The required base must be used unless the institution or the Government can clearly show that it is inequitable or that the institution can show that a more readily available base will not increase costs to the Government. For example, in the case of departmental administration expense pools--generally the largest pool at an educational institution--the current basis for distribution is vague in that such expenses are distributed through the use of a basis subjectively selected by the institution to produce results that are equitable to both the institution and the Government. The revised circular, on the other hand, provides that the expenses be allocated on the basis of total salaries and wages.

We believe that specifically identifying the bases for allocating indirect costs is a significant improvement. If an institution does not consider a specified base equitable,

it must clearly show that another base would be more equitable.

The benefits to be derived, however, will depend on the degree to which the educational institutions comply with using the specified bases.

In our review, we also found that while departmental administration costs (e.g., office supplies) were being directly charged to research, similar costs relating to instruction and other activities were indirectly charged. (See ch. 4.) This is contrary to sound accounting practices and results in excessive charges to research projects. The circular does not clearly prohibit inconsistent treatment of similar types of costs within the same institution.

The OMB revisions to the circular, however, do contain such a provision. The revised circular provides that:

"Other administrative and supporting expenses incurred within academic departments, such as the salaries of secretarial and clerical staff, the salaries of administrative officers and assistants, office supplies, stockrooms, and the like may be allocated to research provided that such expenses are treated consistently as indirect costs in all academic departments of the institutions."

POTENTIAL FOR MORE IMPROVEMENT IN FMC 73-8

Although we believe OMB's revisions have improved FMC 73-8, some weaknesses remain, particularly in the area of compensation for personal services. Salaries and wages account for about 60 percent of the total cost of federally sponsored research at educational institutions. It is important that a feasible system be established to better account for faculty effort on sponsored research.

Most institutions use a system called effort reporting to support professional salary charges to research. Under this system, researchers or persons having firsthand knowledge of the researcher's activities are required to provide monthly after-the-fact reports on actual effort expended. The accuracy of these reports, as well as internal paperwork, required by the institution has been repeatedly called into question by the educational institutions themselves.

The OMB revisions propose to give educational institutions a choice of a system of monitored workloads or a system of personnel activity reports.

The monitored workloads and personnel activity reporting systems do not incorporate several recommendations by HEW, which we believe would provide better control and more definitive guidance for evaluating efforts charged to research. The basic differences between the OMB-proposed revisions and previous HEW revisions, as they relate to compensation for personal services, are outlined below.

Selected Differences Between
OMB-Proposed Revisions and Previous HEW Recommendations
Relating to FMC 71-8 on Personal Compensation

	<u>OMB-proposed revisions</u>	<u>HEW-proposed revisions</u>
Monitored workload system	No requirement for detailed assignment document.	Would require a detailed assignment document which would specify all activities of the person involved in the research project (e.g., how many hours of classroom instruction and committee worktime are devoted to various research projects?).
	No requirement for an internal evaluation of the events which would trigger a change in workload distribution.	This would provide Federal auditors better criteria to determine the relative effort spent by a researcher on a given project.
	Do not provide for an independent review by the institution to insure that the system is working effectively.	Require an internal evaluation by the institution to insure that workload changes are identified and reported and require that the evaluation be documented. Such internal evaluation, in our opinion, is necessary if the system is to work effectively.
Personnel activity reporting system	Require prompt adjustments between budgeted and actual only when significant differences are indicated by such reports.	Would require periodic independent reviews by the institution to assess the integrity of the system. We believe there is a need for internal evaluation to insure that the system is working effectively.
	For professorial and professional employees, the reports will be prepared each academic period or no less frequently than twice a year.	Require prompt adjustments for any differences between budgeted and actual time. This does not leave any discretion to the educational institutions to determine what is a significant difference.
	No requirement as proposed by HEW.	For faculty members and other professionals, the reports must be prepared at least once for each academic period (e.g., semester, trimester, quarter, or summer period, as appropriate). OMB's proposed revision is unclear and leaves the obligation of frequency of reporting to the discretion of the institution, which may cause unnecessary disputes between the institutions and the Government.
		Require that reports be consistent with similar reports of distribution of effort prepared for other purposes, such as those submitted to State or local agencies or legislative bodies, except where the institution can clearly show that differences between the reports are appropriate because of differences in the definition of activities covered by the reports. Such a requirement would provide more credibility to the reported distribution of effort as it relates to Federal research.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

Improvements are needed in the financial management of Federal research by educational institutions. The problems identified in our review relate to (1) misuse of research moneys by the institutions and (2) the lack of definitive cost principles which serve as a guide to the institutions in the financial management of Federal research dollars.

Widespread misuse of Federal research dollars has been reported by HEW and the news media. Our review has confirmed that such misuse is occurring. (See ch. 2.)

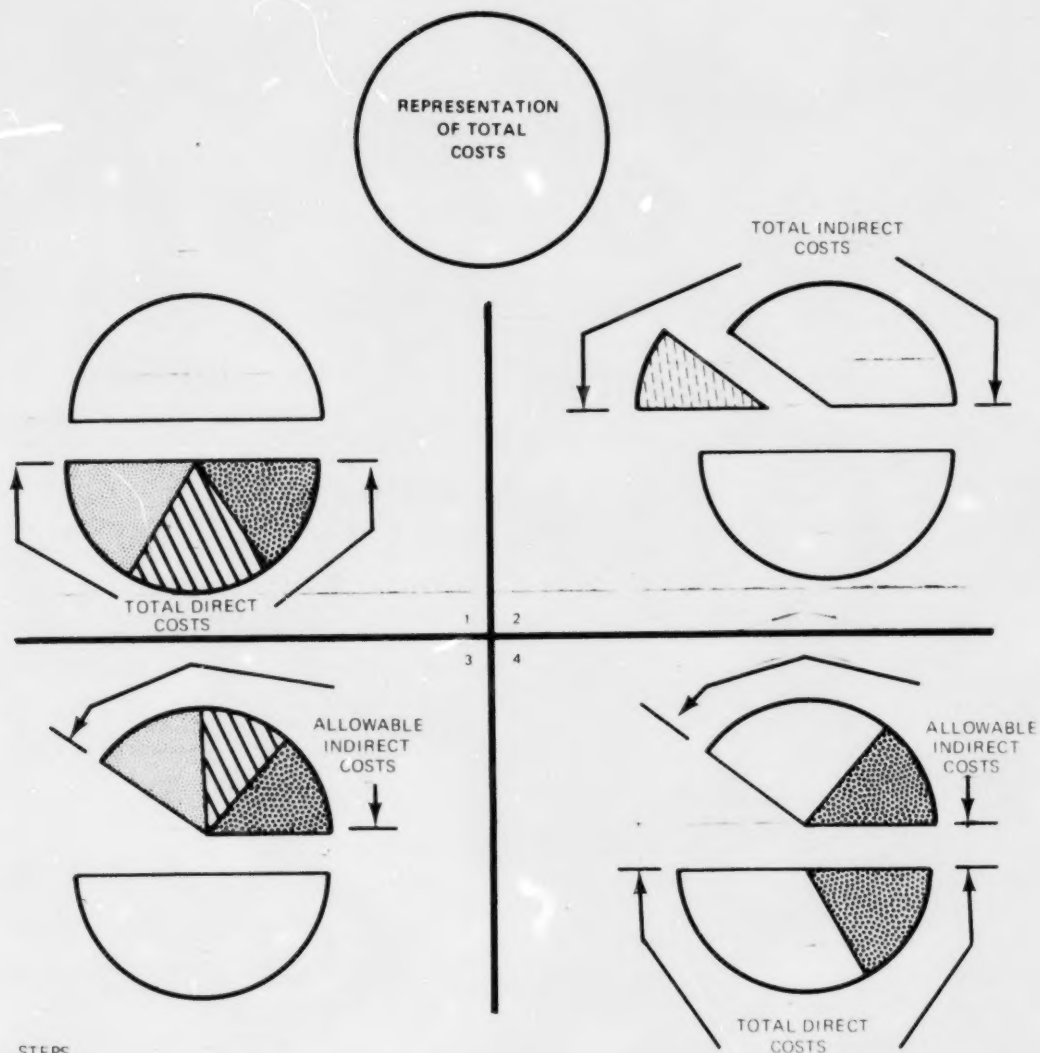
These problems can be minimized through development of more definitive cost principles for both the institutions and the Federal auditors at the institution level, more oversight by grantor agencies with respect to how research moneys are being spent, and increased Federal audit effort. We believe that definitive cost principles serve as the cornerstone for effective performance of the audit and oversight efforts. Many of the problems discussed in this report are the result of the wide latitude and flexibility given to educational institutions by FMC 73-8. Strengthening the cost principles is needed since the absence of more definitive guidance has resulted in varying interpretations and practices and in much disagreement between the Federal Government and educational institutions.

The proposed revisions to FMC 73-8 could help solve many of the problems identified in this report. The HEW-proposed revisions with respect to personal compensation should be reconsidered by OMB. These revisions would further minimize the ambiguities and the discretion institutions have in this area and place more responsibility on the institution for self-policing its activities.

RECOMMENDATION

We recommend that the Director, OMB, reconsider the HEW-suggested revisions, especially in the area of compensation for personal services.

STEPS FOR IDENTIFYING RESEARCH COSTS



EXAMPLE OF HOW INDIRECT COSTS ARE ALLOCATED

	Bldg. & Equip. Deprec./Allow.	Operation & Maintenance	General & Administration	Student Services (thousands)	Libraries	Department Administration	Research Administration	Total
COSTS TO BE ALLOCATED								
Net adjusted allowable costs	\$2,500	\$4,200	\$4,550	\$2,550	\$4,300	\$ 7,800	\$400	\$26,300
Cross allocations	-	→ 100	→ 150 → 300	→ 50 → 100 → 250	→ 350 → 800 → 300	→ 600 → 1,100 → 700	→ 50 → 50 → 50	
Total	<u>\$2,500</u>	<u>\$4,300</u>	<u>\$5,000</u>	<u>\$2,950</u>	<u>\$5,750</u>	<u>\$10,200</u>	<u>\$550</u>	
ALLOCATION OF COSTS								
<u>Intermediate cost objectives</u>								
Operation and Maintenance	\$ 100							
General and Administration	150	\$ 300						
Student Services	50	100	250					
Libraries	350	800	300					
Department Administration	600	1,100	700					
Research Administration	50	50	50					
<u>Final cost objectives</u>								
Research (note a)	700	1,300	1,900	\$ 400	\$1,400	\$ 4,850	\$550	\$11,100
Instruction	350	600	1,450	2,500	3,900	4,650	-	13,450
Other institution activities	150	50	350	50	450	700	-	1,750
Total costs allocated	<u>\$2,500</u>	<u>\$4,300</u>	<u>\$5,000</u>	<u>\$2,950</u>	<u>\$5,750</u>	<u>\$10,200</u>	<u>\$550</u>	<u>\$26,300</u>

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